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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/590,167

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Ian V.J. Archer

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EXAMINER

MEKHLIN, ELI S

ART UNIT

PAPER NUMBER

1793

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/590,167	<b>Applicant(s)</b> ARCHER ET AL.	
	<b>Examiner</b> ELI MEKHLIN	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-14 and 19-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-14 and 19-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/17/2009</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

(1)

This is the second office action on the merits. The Amendment filed June 17, 2009, has been entered. Claims 1-6, 8-14 and 19-20 are pending before the Office for review.

(2)

### ***Information Disclosure Statement***

The information disclosure statement filed June 17, 2009, fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

(3)

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-6, 8-14 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over WEISS et al. (U.S. Patent No. 6,756,024) in views of MORRISON et al. (U.S. Patent No. 4,206,191).

With respect to **claim 1**, WEISS teaches a method for preparing lithium amide that comprises two steps. Abstract. The first step involves contacting lithium metal with

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ammonia to form a bronze. Abstract. The second step involves reacting the lithium bronze with a 1,3-diene or aryl olefin in the presence of solvent. Abstract. WEISS teaches a preferred temperature range but is silent as to whether the reaction can be conducted at a temperature between -33 °C and -78°C.

However, MORRISON, which deals with a method for the preparation of lithium amide, teaches that lithium amide preparation reactions can be conducted in temperatures in the range of -30 °C and -60 °C. Col. 5, Lines 17-23. This coincides with WEISS'S statement that the heat of reaction of the lithium-ammonia reaction is controlled by controlling the rate of dosage of ammonia or by jacket cooling. Col. 1, Lines 66-67, Col. 2, Lines 1-3. Specifically, a person having ordinary skill in the art at the time of invention would appreciate that using the temperature range taught by MORRISON allows for more control over the heat of reaction such that ammonia does not reach a temperature above its boiling point in a closed vessel.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of invention to use the temperature range taught by MORRISON in the lithium amide preparation process taught by WEISS because MORRISON teaches a temperature range that can be used to safely control the heat of reaction.

With respect to **claim 2**, WEISS teaches that the ammonia is brought into contact with lithium by adding the ammonia to lithium. Col. 2, Lines 29-32.

With respect to **claim 3**, WEISS teaches that the 1,3-diene or aryl olefin can be one of either butadiene, isoprene, piperylene, dimethylbutadiene, hexadiene, styrene, methyl styrene, naphthalene or anthracene. Col. 1, Lines 47-49.

With respect to **claim 4**, WEISS teaches that the 1,3-diene or arylolefin can be one of either styrene or methyl styrene.

With respect to **claim 5**, WEISS teaches that the solvent for the reaction can be one of pentane, cyclopentane, THF, dioxane or glycol ether. Col. 1, Lines 50-59.

With respect to **claim 6**, WEISS teaches that the ammonia is added to lithium in a 4:1 ratio. Col. 2, Lines 29-31.

With respect to **claim 8**, the lithium amide composition recovered by WEISS is  $\text{LiNH}_2$  in a lithium amide to ammonia ratio of 1:3. Col. 1, Figure 1. WEISS further teaches that ammonia can be removed via reduced-pressure evaporation. Col. 2, Lines 55-56. Finally, MORRISON teaches that the lithium amide reaction can be carried out at a temperature of  $-40^\circ\text{C}$ . Col. 7, Lines 62-55.

With respect to **claim 9**, WEISS uses the procedure to prepare  $\text{LiNH}_2$ , a lithium amide. Col. 1, Figure 1.

With respect to **claim 10**, MORRISON teaches that the lithium amide reaction can be carried out at a temperature of  $-40^\circ\text{C}$ . Col. 7, Lines 62-55.

With respect to **claim 11**, MORRISON teaches that the lithium amide reaction can be carried out at a temperature of  $-40^\circ\text{C}$ . Col. 7, Lines 62-55.

With respect to **claim 12**, the lithium amide composition recovered by WEISS is  $\text{LiNH}_2$  in a lithium amide to ammonia ratio of 1:3. Col. 1, Figure 1. WEISS further teaches that ammonia can be removed via reduced-pressure evaporation. Col. 2, Lines 55-56. Finally, MORRISON teaches that the lithium amide reaction can be carried out at a temperature of  $-40^\circ\text{C}$ . Col. 7, Lines 62-55.

With respect to **claim 13**, WEISS teaches that the solvent for the reaction can be one of pentane, cyclopentane, THF, dioxan, or glycol ether. Col. 1, Lines 50-59.

With respect to **claim 14**, WEISS teaches that the solvent for the reaction can be one of pentane, cyclopentane, THF, dioxan, or glycol ether. Col. 1, Lines 50-59.

With respect to **claim 19**, the lithium amide procedure taught by WEISS yields an  $\text{LiNH}_2$  amide that is in a 1:3 ration with ammonia. Col. 1, Figure 1.

With respect to **claim 20**, the lithium amide procedure taught by WEISS yields an  $\text{LiNH}_2$  amide that is in a 1:3 ration with ammonia. Col. 1, Figure 1.

(4)

### ***Response to Arguments***

Applicant's arguments filed June 8, 2009, have been fully considered but they are not persuasive for the following reasons"

First, Applicant's arguments that the method taught by Morrison requires a catalyst is not persuasive because Claim 1 is marked by the transitional phrase "comprising," which is "inclusive or open-ended and does not exclude additional, unrecited elements or method steps." MPEP 211.03 [R-3].

Additionally, although WEISS teaches a preferred temperature range of 0 to 30°C, WEISS does not teach away from the temperature range of -33°C to -78°C. Specifically, a person having ordinary skill in the art at the time of invention would appreciate that choosing a synthetic route for a target compound is a complicated process that involves the balancing of a number of considerations such as cost, purity, safety and difficulty of the reaction.

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WEISS teaches a synthetic route wherein the temperature is kept at ambient temperature to prevent any hydrogen formation so that pure ammonia can be recovered and reused. Specifically, WEISS, as described above, teaches that using a 1,3-diene or aryl olefin in the reaction and running the reaction at ambient temperature suppresses any hydrogen formation.

However, a person having ordinary skill in the art at the time of invention would have appreciated that using ammonia at room temperature presents a possibly dangerous situation because ammonia boils at  $-33\text{ }^{\circ}\text{C}$  and using ammonia at a temperature above its boiling point in a closed container raises the possibility of an explosion. A person having ordinary skill in the art at the time of invention would have appreciated that the lithium amide synthesis is conducted under a closed, inert atmosphere and anhydrous conditions because lithium metal is highly pyrophoric.

Faced with this dilemma, as discussed above, prior art lithium amide synthetic routes utilized depressed temperatures of  $-78\text{ }^{\circ}\text{C}$  to  $-33\text{ }^{\circ}\text{C}$  to control the heat of reaction of ammonia during the reaction and also depress the pressure within the reaction vessel. Therefore, a compromise could be reached between WEISS'S synthetic route and the prior art's synthetic route wherein some hydrogen formation is tolerated for safety's sake.

Therefore, the reaction temperatures taught by MORRISON would have been pertinent in the synthesis taught by WEISS because doing so simply involves choosing a safer reaction route with suppressed hydrogen production. Thus, it would be advantageous to determine if using the 1,3-diene or aryl olefin reaction method taught

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by WEISS at depressed temperatures suppresses hydrogen production to tolerable levels because WEISS teaches that 1,3-diene or aryl olefin can be used at ambient temperature to completely suppress hydrogen production.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELI MEKHLIN whose telephone number is (571)270-7597. The examiner can normally be reached on 5/4/9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ELI MEKHLIN/  
Examiner, Art Unit 1793

/J.A. LORENZO/  
Supervisory Patent Examiner, Art  
Unit 1793